



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,063	09/05/2003	Hassan Mostafavi		8329

23639 7590 09/30/2005  
BINGHAM, MCCUTCHEN LLP  
THREE EMBARCADERO CENTER  
18 FLOOR  
SAN FRANCISCO, CA 94111-4067

EXAMINER
----------

SONG, HOON K

ART UNIT	PAPER NUMBER
----------	--------------

2882

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/656,063

Applicant(s)

MOSTAFAVI, HASSAN

Examiner

Hoon Song

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/23/2005 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-14, 16-21, 23-31 and 33-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Horiba et al. (US 4672651).

Regarding claims 1, 11, 18, 28, 35 and 43 Horiba teaches a method or a computer readable medium having a set of stored instruction of processing a x-ray image, comprising:

collecting a first x-ray image (one of the eight mask image) and a second x-ray image (one of the eight mask image);

determining a composite image (summed mask image, column 5 line 38) based on the first and second x-ray images;

collecting a third x-ray image (live image, column 5 line 59), wherein at least a portion of the first x-ray image and at least a portion of the third x-ray image comprises images of a same portion of an object; and

enhancing a feature in the third x-ray image by adjusting (subtraction, column 5 line 59) the third x-ray image based on the composite image.

Regarding claims 2, 12, 19, 29 36 and 44, Horiba teaches the first, second, and third x-ray images are generated in a sequence (column 5 line 30-60).

Regarding claims 3, 13, 20, 30 37 and 45, Horiba teaches the first, second, and third x-ray images are each contains an image of at least a portion of an animal body (column 5 line 30-60).

Regarding claims 4, 14, 21, 31 38 and 46, Horiba teaches the determining a composite image comprises performing a image averaging on the first and second x-ray images (column 5 line 38).

Regarding claims 6, 16, 23 and 33, Horiba teaches the image averaging is performed based on a weighted average (column 5 line 30-60).

Regarding claims 7, 17, 24 and 34, Horiba teaches the adjusting comprises subtracting the composite image from the third x-ray image (column 5 line 59).

Regarding claims 48-50, Horiba teaches the feature comprises a moving feature (heart).

Regarding claims 8, 25 and 40, Horiba teaches a system for processing a x-ray image, comprising:

Art Unit: 2882

means for collecting a first x-ray image and a second x-ray image (figure 1, eight mask images);

means for determining a composite image based on the first and second x-ray images (column 5 line 38);

means for collecting a third x-ray image (live image), wherein at least a portion of the first x-ray image and at least a portion of the third x-ray images comprises images of a same portion of an object (column 5 line 30-60); and

means for enhancing a feature in the third x-ray image by adjusting (subtraction, column 5 line 59) the third x-ray image based on the composite image.

Regarding claims 9, 26 and 41, Horiba teaches the means for determining a composite image comprises means for performing an image averaging on the first and second x-ray images (column 5 line 38).

Regarding claims 10 and 27, Horiba teaches the means for adjusting comprises means for subtracting the composite image from the third x-ray image (column 5 line 59).

Regarding claims 39, 42 and 47, Horiba teaches determining a value associated with a contrast of the composite image (column 5 line 30-60).

Regarding claims 51-53, Horiba teaches the first and the second x-ray images are generated using an imaging device that remains stationary between a first time at which the first x-ray image is generated and a second time at which the second x-ray image is generated (figure 1).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 7-8, 10-13, 17-20, 24-25, 27-30, 34-37, 40, 43-45 and 48-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeo (US 6125166).

Regarding claims 1, 11, 18, 28 35 and 43, Takeo teaches a method or a computer readable medium having a set of stored instruction of processing a x-ray image, comprising (figure 6):

collecting a first x-ray image (41) and a second x-ray image (42);

determining a composite image (44) based on the first (41) and second x-ray images (42);

collecting a third x-ray image (61), wherein at least a portion of the first x-ray image (41) and at least a portion of the third x-ray image (61) comprises images of a same portion of an object; and

enhancing a feature in the third x-ray image by adjusting (subtraction,  $S_1'$ ) the third x-ray image (61) based on the composite image (44).

Regarding claims 2, 12, 19, 29, 36 and 44, Takeo teaches the first (41), second (42), and third x-ray images (61) are generated in a sequence.

Regarding claims 3, 13, 20, 30 37 and 45, Takeo teaches the first (41), second (42), and third x-ray images (61) are each contains an image of at least a portion of an animal body (figure 1).

Regarding claims 7, 17, 24 and 34, Takeo teaches the adjusting comprises subtracting (subtraction,  $S_1'$ ) the composite image (44) from the third x-ray image (61).

Regarding claims 48-50, Takeo teaches the feature comprises a moving feature (heart).

Regarding claims 8, 25 and 40, Takeo teaches a system for processing a x-ray image, comprising:

means for collecting a first x-ray image (41) and a second x-ray image (42);

means for determining a composite image (44) based on the first (41) and second (42) x-ray images;

means for collecting a third x-ray image (61), wherein at least a portion of the first x-ray image (41) and at least a portion of the third (61) x-ray images comprises images of a same portion of an object; and

means (36) for enhancing a feature in the third x-ray image by adjusting (subtraction,  $S_1'$ ) the third x-ray image (61) based on the composite image (44).

Regarding claims 10 and 27, Takeo teaches the means for adjusting comprises means for subtracting (subtraction,  $S_1'$ ) the composite image from the third x-ray image.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 15, 22 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba et al. in view of Hopple et al. (US 6546124 B1).

Regarding claims 5, 15, 22 and 32, Horiba fails to teach the image averaging is performed using a boxcar averaging technique.

Hopple teaches a boxcar averaging technique (21).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the imaging averaging method of Horiba with the boxcar averaging as taught by Hopple, since the boxcar averaging would provide faster calculations for generating the averaged image.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-53 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.




Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

9/21/05  
HKS

  
DAVID V. BRUCE  
PRIMARY EXAMINER